

1966  
MASTER PLAN FOR RESERVOIR MANAGEMENT

BLACKWATER RESERVOIR

MERRIMACK RIVER BASIN

MERRIMACK COUNTY, NEW HAMPSHIRE

NEW ENGLAND DIVISION

CORPS OF ENGINEERS

DA 12 Blackwater R



## BLACKWATER RESERVOIR

### MASTER PLAN FOR RESERVOIR MANAGEMENT

1. Authorization and Purpose. - The Blackwater Dam and Reservoir project was authorized by the Flood Control Act approved 22 June 1936, (Public Law 738 - 74th Congress) as modified by the Flood Control Act approved 28 June 1938, (Public Law 761 - 75th Congress) as part of a system of flood control works in the Merrimack River Basin. Construction of the dam was started in May 1940 and completed in November 1941. Authorization for development of reservoir areas for public park and recreational purposes is contained in Section 4 of the Flood Control Act approved 22 December 1944, (Public Law 534 - 78th Congress), as amended by the Flood Control Act approved 24 July 1946, (Public Law 526, 79th Congress). This master plan for reservoir management is submitted in accordance with paragraph 4224.07 of Orders and Regulations of the Office of Chief of Engineers, Department of the Army, dated 15 October 1952.

2. Location and Description of Project. - Blackwater Dam, controlling a

drainage area of 128 square miles, is located on the Blackwater River about 8.6 miles above its confluence with the Contoocook River. It is just above the village of Swetts Mills, in the Town of Webster, Merrimack County, New Hampshire and is about 12.5 miles northwest of the city of Concord, New Hampshire. The dam is a rolled earth fill structure with a concrete non-overflow section and spillway across the river at the northeast end of the embankment. Its length is 1150 feet with a maximum height of 75 feet above the stream bed. In addition to the main dam, two dikes, totaling 1375 feet in length, close off low saddles on the west rim of the reservoir. Control is effected by three hydraulically operated slide gates with a discharge capacity of 2,800 c.f.s. at spillway elevation. The reservoir lands are fee-owned and amount to 3,605 acres, of which 74% are woodland, 21% are open crop and pasture land, and the remaining 5% is water. At spillway elevation, the flooded area of the reservoir extends up the Blackwater River about seven miles and inundates 3,140 acres to a maximum depth of 56 feet. The reservoir area is less than one-half mile wide for a distance of one mile above the

dam, widens out to a maximum width of two miles in the central portion and narrows again to a width of less than one-half mile in the upper two miles of the area. The main stream meanders through the reservoir area with a generally uniform slope of about six feet per mile. The valley bottom and the gentler slopes in the central portion are cleared and used for pasturage and crop under lease to former owners and other residents in the vicinity. The woodland species are predominantly soft woods consisting of white pine, hemlock, red pine and a few red spruce. Mixed hardwoods of maple, white birch, and oak are scattered throughout the area. The climate for the area is variable, with a mean annual temperature of 45°F. Freezing has been experienced in all months of the year except June, July, and August. The mean annual precipitation is about 37 inches and the average annual snowfall about 68 inches.

3. Interest in Public Use of the Area. - Interest in public use of the reservoir area was sporadic from the date of completion of the project until 1951. In 1946 consideration was given to the possibility of establish-



ment of a recreation area including a summer pool in the portion of the area immediately upstream of the dam. This proposal was dropped because of lack of interest by state officials. In 1951 the State Forester approached this office relative to assuming management of the area in the interest of forest conservation, including forest fire protection and disease and insect control. Subsequently several conferences were held with representatives of the Forestry and Recreation Commission, the Fish and Game Department, and the New Hampshire Water Resources Board relative to appropriate public use of the reservoir area. On 21 July 1953 the Governor of New Hampshire designated the Forestry and Recreation Commission as the state agency to be licensee of the area and requested that a 25-year license be issued to that agency. A copy of the Governor's letter is inclosed as Appendix A. The plan of development and operation of the area as outlined herein was prepared in consultation with the Forestry and Recreation Commission.

4. Description and Population of the Region. - The project is located in the south central portion of New Hampshire in close proximity to the in-

dustrial and population centers of the state. Concord, the capital city, lies 12 miles to the southeast; Manchester, the largest industrial center, is 25 miles to the southeast; Nashua, another important industrial center, is 40 miles to the south; Franklin, a textile center, is nine miles to the northeast; and Laconia, a manufacturing center known as the "Gateway to the White Mountains," is 24 miles to the northeast. Based on 1950 census figures, a year-round population of 13,813 is estimated to reside within 10 miles, 107,605 within 25 miles, and 212,278 within 30 miles of the project. The summer season population is significantly larger due to occupancy of the cottages and summer homes bordering the numerous lakes and ponds in the area.

5. Recreational Features of the Region. - Recreation provides the second largest source of revenue in the State of New Hampshire. It was estimated at \$138,000,000 in 1952 and growing yearly. The state attracts visitors from all parts of the country during the summer months and in the winter months attracts winter sports enthusiasts from southern New England and New York. In addition to the many privately-operated recreational

— facilities throughout the lakes and mountains are numerous public facilities.

There are 111 state reservations including 26 parks, many of which are developed for public recreational facilities. The attendance at the state park system was estimated at 2,000,000 persons in 1952. In addition, the White Mountain National Forest, a national attraction, has 17 areas with facilities developed for recreational activities. Table 1 sets forth public recreation areas within 25 miles of the project and accompanying Plate No. 1 shows their location. The extensive developments at the Bear Brook, Mt. Sunapee, and Belknap areas are widely known and attract many out-of-state visitors. The southernmost White Mt. Forest developments are only 28 miles from the project and attract campers, mountain climbers, and skiers from considerable distances.



TABLE 1

PUBLIC RECREATION AREAS

<u>No.</u>	<u>Name</u>	<u>Miles from Blackwater Dam</u>	<u>Bath- ing</u>	<u>Boat- ing</u>	<u>Camp- ing</u>	<u>Fish- ing</u>	<u>Hik- ing</u>	<u>Picnick- ing</u>	<u>Scenic Road</u>	<u>Ski- ing</u>
1	Bear Brook State Park	24	x	x		x	x	x		
2	Cardigan State Park	25					x	x		
3	Endicott Rock State Park	25	x			x		x		
4	Fox State Forest	16			x			x		
5	Toll Gate State Park	7					x	x	x	
6	Winslow Site State Park	9					x	x	x	
7	Mount Sunapee State Park	18	x			x	x	x		x
8	Pillsbury State Park	19				x	x	x		
9	Wadleigh State Park	12	x	x		x		x		
10	Wellington State Park	24	x			x	x	x		
11	County Area - Belknap Recreation Area	23			x		x	x		x

6. Natural Resources of Project and Features Adaptable for Public

Use. - The Blackwater Reservoir area has limited resources with recreation potential. Inasmuch as the project is operated for control of flood flows, the summer months usually find only the normal river flowing through the reservoir and development of bathing facilities is not practicable. Recreation authorities advise that a pond or lake is a primary requisite for successful development. Access to the area is by a secondary macadam state road, Route 127, which connects with the principal east-west roads (Routes 9 and 202) and north-south roads (Routes 3 and 4). Two secondary local roads cross the upper portion of the area and would be closed only infrequently due to operation of the project. The side hill slopes of the reservoir are gentle and generally covered with stands of white pine, hemlock and spruce with scatterings of hard woods. The central portion of the valley bottom and some of the lower hillsides are cleared and used for pasturage and a few crops under out-lease grants. The river in the reservoir area together with tributary brooks are reported by fish and game representatives to be

good fish streams. Considerable use of the area is made by fishermen. In 1953 the Fish and Game Department stocked 11,000 fingerling brown trout and 600 legal brook trout in the Blackwater River including the reservoir area. In 1952 two stockings of rainbow trout were made in the river. Hunters make extensive use of the area for deer and small game in season. Woodland in the area has been untouched since construction of the project except for a small amount of clearing of frequently inundated areas to prevent clogging of the trash racks at the dam. There is a large amount of blown-down timber in some parts of the reservoir and throughout the entire area good conservation practices require clearing of undesirable undergrowth, thinning, clearing of fire lanes, and disease and insect control. State authorities have expressed concern over means of fire protection and insect control. It appears that management of the forest resource, improvement for fish and game propagation, continued agricultural use of open lands, and the installation of one or two roadside picnic areas, are the most beneficial public uses to be made of the reservoir area.



7. Allocation of Uses. - The Forestry and Recreation Commission has been designated by the Governor of New Hampshire to be the state agency to receive a license in the reservoir area. The license will include all the project area except for the structures and strips of land not less than 200 feet in width from the structures, which will be reserved for project operation and maintenance. The designated state agency will coordinate the interests and activities of other state and local agencies in public use of the area. Representatives of the forestry, recreation, and fish and game departments of the state have considered the possible uses of the areas and this plan is a result of consultation with these representatives. Recreation use will be limited to roadside picnic areas upstream of the dam on the right bank. A fish and game stocking and management program will be gradually installed throughout the area in conjunction with the forest management program and consistent with the agricultural leasing program. This latter program will be continued as long as there is interest in this activity by residents in the vicinity of the reservoir area. The forestry management

program would be carried on throughout the license area. Accompanying Reservoir Map, Plate No. 2, shows the limit of Government ownership, spillway contour, proposed limit of license, existing agricultural lease areas, including tract numbers, and proposed picnic area.

8. Plan of Development. - The major activity in the reservoir development will be the management of the forest resource. The boundaries of the area will be marked first. Then the area will be type-mapped to determine basic conditions of trees and soil. Inferior and worthless species will be eliminated and plots will be put in their most suitable growth. Selective cutting and thinning will be effected to improve growth rates. Disease and insect control measures will be instituted.

The area will be policed and roads and trails will be maintained and improved to furnish adequate access for fire control.

The licensee will coordinate forest management practices with the Fish and Game Department so that improved habitat may be provided for forest

animals. The Fish and Game Department will make hedge row and game food plantings to encourage propagation of desired species, and stock the area consistent with overall plans for the region.

A roadside picnic area is proposed upstream of the dam on the right bank. Tables, benches and disposal containers will be initially furnished. In the event of sufficient public interest, suitable fireplaces and other facilities will be subsequently installed.

The reservoir will continue to be open to public hunting, fishing, and trapping consistent with applicable state laws.

9. Schedule of Development. - The initial operation by the licensee will be the preparation of a type map of the area and establishment of a detail forest management plan. Subsequent operation will be maintenance and improvement of roads for fire protection purposes, improvement work consisting of clearing out inferior growths and establishment of plots in optimum growth, plantings, and selective cuttings and thinnings. The



insect control program will be established early in the overall program.

The activities in the picnic area and in fish and game management will probably start in the second year and be coincident with the forest management program. The yearly operation will be detailed in the annual management program to be prepared by the licensee for approval by the Division Engineer. The funds to be expended in the area will be dependent on appropriations available to the state agencies. It is estimated that at the inception of the program yearly expenditure will approximate \$2500.

10. Conclusions and Recommendations. - The allocation of use as set forth in this report is believed to provide maximum utilization of resources consistent with the primary purpose of the project. The maximum benefits to recreation, forestry, and fish and wildlife will be realized by management of areas allocated to public use by the New Hampshire Forestry and Recreation Commission. This agency has expressed a desire to develop the area in accordance with the above plan of development.

It is recommended that the allocation of use outlined herein be approved. It is further recommended that a license be granted to the New Hampshire Forestry and Recreation Commission for a 25-year period for recreation, fish and wildlife, forestry and other management purposes. The proposed license is included as Appendix B.

# STATE OF NEW HAMPSHIRE

EXECUTIVE DEPARTMENT

CONCORD

July 21, 1953

Division Engineer  
Corps of Engineers, U. S. Army  
857 Commonwealth Avenue  
Boston 15, Massachusetts

Dear Sir:

It has come to my attention that Mr. William H. Messee, Jr., State Forester of the New Hampshire Forestry and Recreation Commission, has discussed with representatives of your organization the possibility of licensing the flood control reservoirs in New Hampshire for forest management and recreational uses. The existing license to the New Hampshire Fish and Game Commission of the Howard MacDowell Reservoir has been beneficial to the State and it is desired that public use of the other reservoir areas be increased consistent with their prime use for control of flood waters.

Accordingly, I am designating the New Hampshire Forestry and Recreation Commission as the State agency to be licensee of the reservoirs at Franklin Falls, Scurry Mountain and Black Water and request that appropriate licenses be issued to that agency for forest management and recreational uses for a 25-year period. It would be advisable to expand the public use of the Howard MacDowell Reservoir, and I am requesting that the existing license for that reservoir area be amended to provide for use by the State of New Hampshire for forest management and recreational uses as well as fish and game management.

Mr. William H. Messee, Jr., State Forester, who has been engaged in developing the forest management phase of this program, is familiar with the provisions of the proposed licenses and it is probable for the working out of the details involving license boundaries and other

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OSTON, MASS.

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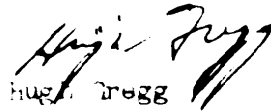
Division Engineer

Page 2

July 31, 1953

matters relating to these new licenses. He also may act as liaison man with the Fish and Game Department in consideration of an amendment of the existing license at the Edward MacDowell Reservoir.

Sincerely,

  
Hugh Gregg

DEPARTMENT OF THE ARMY  
LICENSE  
FOR RECREATIONAL PURPOSES  
BLACKWATER RESERVOIR AREA

THE SECRETARY OF THE ARMY, under authority of Section 4 of the Flood Control Act of 1946 (60 Stat. 641, 642; 16 U.S.C. 460d), hereby grants to the Forestry and Recreation Commission of the State of New Hampshire a license for a period of twenty-five (25) years commencing on date of execution of this instrument, to use and occupy approximately 3535 acres of land and water areas under the primary jurisdiction of the Department of the Army in the Blackwater Reservoir Area, as outlined in red on Exhibit A, numbered \_\_\_\_\_, dated \_\_\_\_\_, attached hereto and made a part hereof, for recreation, fish and wildlife, forestry, and other management uses.

THIS LICENSE is granted subject to the following provisions and conditions:

1. That the licensee, in the exercise of the privileges hereby granted, shall conform to such rules and regulations as may be prescribed by the Secretary of the Army to govern the public use of the said reservoir area, and with the provisions of Section 4 of the Flood Control Act of 1946 (60 Stat. 641, 642; 16 U.S.C. 460d).

2. That the exercise of the privileges hereby granted shall be without cost or expense to the United States, and the licensee understands and agrees that the land indicated above is property of the United States acquired for use in the construction, operation, and maintenance of the Blackwater Reservoir for flood control purposes, with any and all other uses of said land being

incidental thereto, and that the exercise of such privileges hereby granted is subject to the supervision and approval of the Division Engineer, Corps of Engineers, in charge of the locality and subject also to such regulations as may be prescribed by him from time to time.

3. That the licensee may construct upon said land such buildings, improvements, facilities, accommodations, fences, signs, wharves, piers, boat slips, and other structures as may be necessary for the purposes of this license, and may plant seeds, shrubs, and trees, provided that all such structures shall be constructed and the landscaping accomplished in accordance with plans approved by the Division Engineer, Corps of Engineers, in charge of the administration of the property.

4. That the licensee may take, trap, remove, stock or otherwise control all forms of wildlife upon the said land, and shall have the right to close the area or any part or parts of the area to fishing, hunting and/or trapping, provided that the closing of any area to such use shall be consistent with the State laws for the protection of fish and wildlife.

5. That this license shall be subject to any existing easements, leases, licenses and permits, or renewals thereof, and to any future easements, leases, licenses or permits affecting the area covered by this license; provided, however, that such future grants will not be inconsistent with the purpose of this license and that the said Division Engineer will give advance notice to the licensee of any proposed grant in order that the licensee may take any necessary action to preserve wildlife thereon.

6. That the licensee shall administer and maintain the said property,

for the purposes of this license, in accordance with the Master Plan for the said reservoir area and with an Annual Management Program to be mutually agreed upon between the licensee and the said Division Engineer, which may be amended from time to time as may be necessary. Such Annual Management Program shall include, but is not limited to, the following:

a. Plans for management activities to be undertaken by the licensee or jointly by the Corps of Engineers and the licensee.

b. Budget of the licensee for carrying out the management activities.

c. Personnel to be used in the management of the area.

7. That the right is hereby expressly reserved to the United States to develop or permit development by others of public-use areas in the above-described area at locations which have been or will be mutually agreed upon by the parties hereto.

8. That the licensee shall protect the property from fire, vandalism and soil erosion, and may make and enforce such rules and regulations as are necessary, and within its legal authority, in exercising the privileges granted in this license, provided that such rules and regulations are not inconsistent with those prescribed by the Secretary of the Army to govern the public use of the reservoir area.

9. That the licensee, in exercising its Governmental or proprietary functions, may operate facilities and accommodations and provide services needed by the public directly, and may enter into concession agreements with third parties for providing needed services to the public, provided

that any such agreements have the prior approval of the said Division Engineer, and provided further, that any profits obtained by the licensee from any such agreements shall be utilized by the licensee in the future development of the area. The licensee and its concessionaires may make reasonable charges for such services and for the use of such facilities and accommodations, provided that such charges shall have the prior written approval of the said Division Engineer.

10. That the licensee shall, within the limits of available funds, proceed immediately with the development of said lands for the purpose of this license and prosecute its program to completion in an orderly manner and at a rate consistent with the needs of the public.

11. That the right is hereby expressly reserved to the United States, its officers, agents, and employees, to enter upon the said land and water areas at any time and for any purpose necessary or convenient in connection with river and harbor and flood control work, and to remove therefrom timber or other material required or necessary for such work, to flood said premises when necessary, and/or to make any other use of said land as may be necessary in connection with public navigation and flood control, and the licensee shall have no claim for damages of any character on account thereof against the United States or any agent, officer, or employee thereof.

12. That any property of the United States damaged or destroyed by the licensee incident to the exercise of the privileges herein granted shall be promptly repaired or replaced by the licensee to the satisfaction of the

said Division Engineer.

13. That the United States shall not be responsible for damages to property or injuries to persons which may arise from or be incident to the exercise of the privileges herein granted, or for damages to the property of the licensee, or for damages to the property or injuries to the person of the licensee's officers, agents, servants, or employees or others who may be on said premises at their invitation or the invitation of any one of them, arising from or incident to the flooding of said premises by the Government or flooding from any other cause, or arising from or incident to any other governmental activities on the said premises and the licensee shall hold the United States harmless from any and all such claims, except as otherwise provided in Condition No. 14 hereof.

14. That all uranium, thorium, and all other materials determined pursuant to section 5 (b) (1) of the Atomic Energy Act of 1946 (60 Stat. 761) to be peculiarly essential to the production of fissionable material, contained, in whatever concentration, in deposits in the lands covered by this instrument are hereby reserved for the use of the United States, together with the right of the United States through its authorized agents or representatives at any time to enter upon the land and prospect for, mine, and remove the same, making just compensation for any damage or injury occasioned thereby. However, such land may be used, and any rights otherwise acquired by this disposition may be exercised, as if no reservation of such materials had been made; except that, when such use results in the extraction of any

such material from the land in quantities which may not be transferred or delivered without a license under the Atomic Energy Act of 1946, as it now exists or may hereafter be amended, such material shall be the property of the United States Atomic Energy Commission, and the Commission may require delivery of such material to it by any possessor thereof after such material has been separated as such from the ores in which it was contained. If the Commission requires the delivery of such material to it, it shall pay to the person mining or extracting the same, or to such other person as the Commission determines to be entitled thereto, such sums including profits, as the Commission deems fair and reasonable for the discovery, mining, development, production, extraction, and other services performed with respect to such material prior to such delivery, but such payment shall not include any amount on account of the value of such material before removal from its place of deposit in nature. If the Commission does not require delivery of such material to it, the reservation hereby made shall be of no further force or effect.

15. That the license may be relinquished by the licensee at any time by giving to the Secretary of the Army, through the said Division Engineer, at least thirty (30) days' notice in writing.

16. That this license may be revoked by the Secretary of the Army in the event the licensee violates any of the terms and conditions of this license and continues and persists therein for a period of thirty (30) days after notice thereof in writing by the said Division Engineer.

17. That, on or before the date of expiration of this license or its

relinquishment by the licensee, the licensee shall vacate the said Government premises, remove all property of the licensee therefrom, and restore the premises to a condition satisfactory to the said Division Engineer. If, however, this license is revoked, the licensee shall vacate the premises, remove said property therefrom, and restore the premises as aforesaid within such time as the Secretary of the Army may designate. In either event, if the licensee shall fail or neglect to remove said property and so restore the premises, then said property shall become the property of the United States without compensation therefor, and no claim for damages against the United States or its officers or agents shall be created by or made on account thereof.

IN WITNESS WHEREOF I have hereunto set my hand by direction of the Assistant Secretary of the Army this \_\_\_\_\_ day of \_\_\_\_\_, 1954.

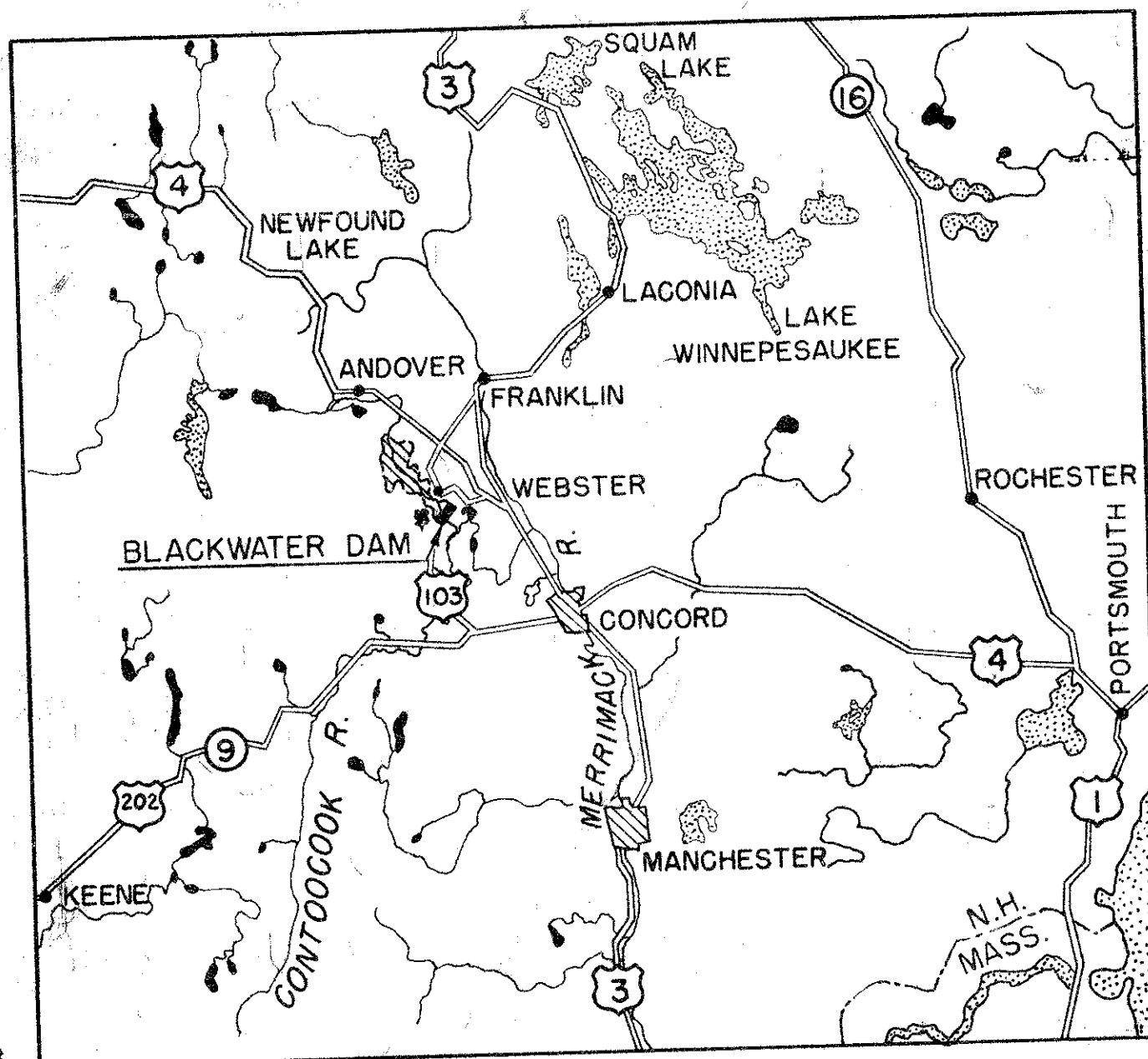
The above instrument, together with the provisions and conditions thereof, is hereby accepted this \_\_\_\_\_ day of \_\_\_\_\_, 1954.

STATE OF NEW HAMPSHIRE  
Forestry and Recreation Commission

By \_\_\_\_\_

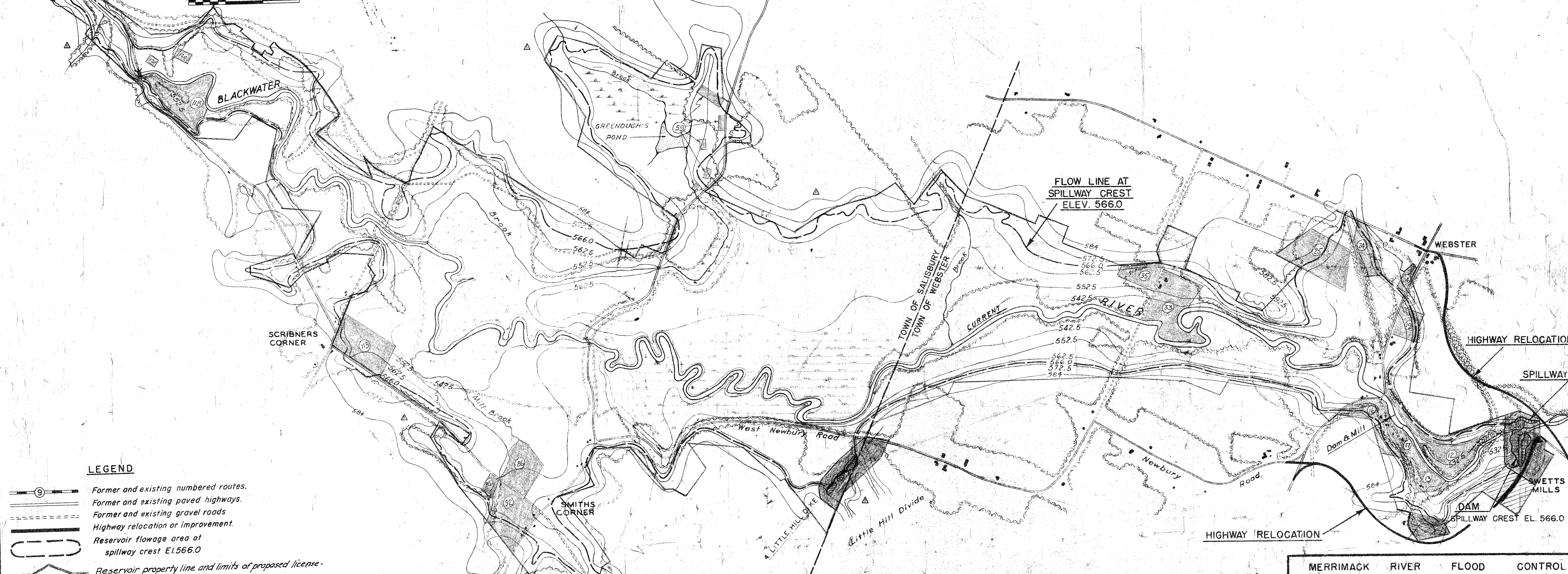
ENG FORM 1736  
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VICINITY MAP

SCALE IN MILES  
0 10 20

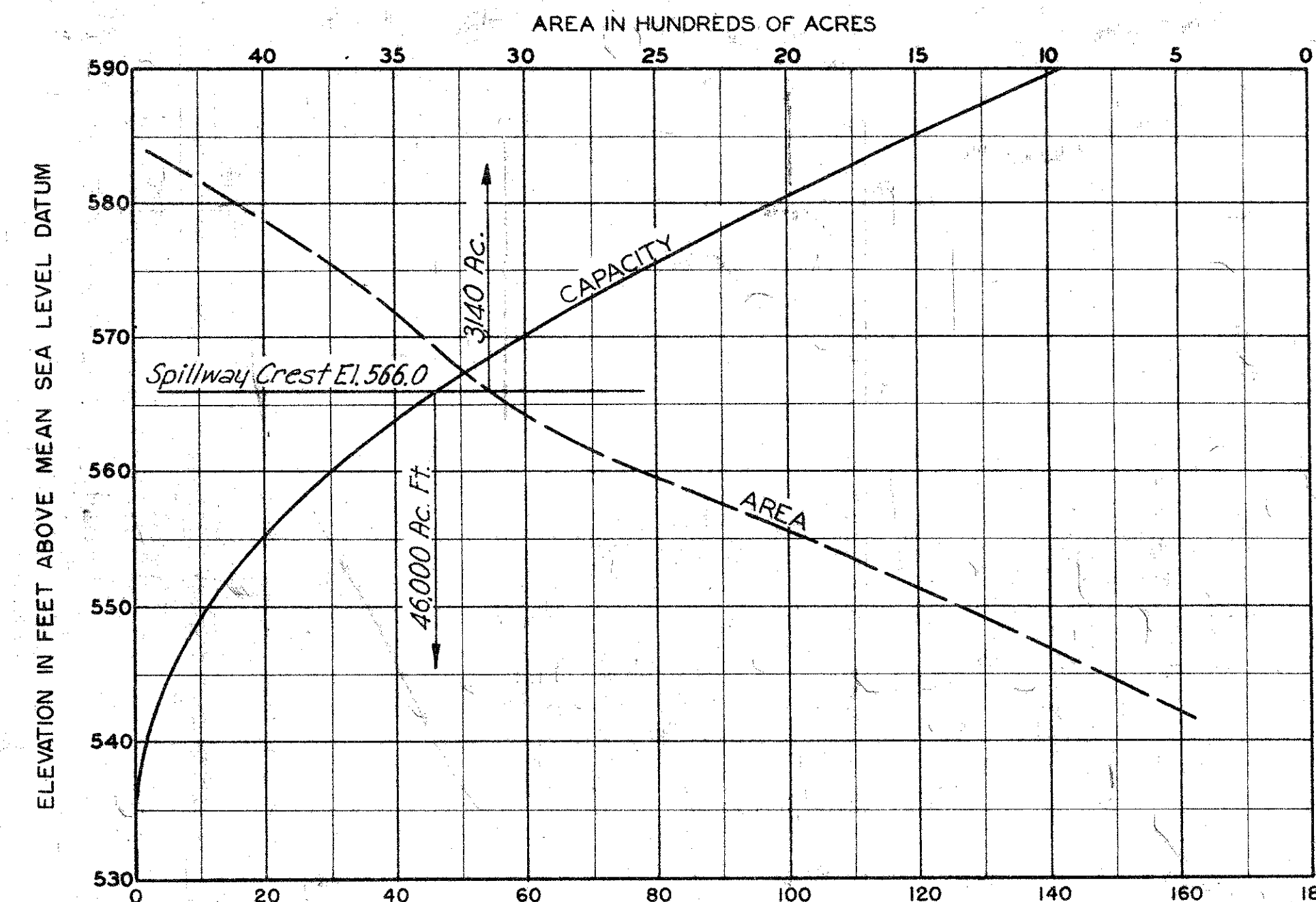


LEGEND

- Former and existing numbered routes.
- Former and existing paved highways.
- Former and existing gravel roads.
- Highway relocation or improvement.
- Reservoir flowage area of spillway crest elevation 566.0.
- Reservoir property line and limits of proposed license.
- Area excluded from license.
- Existing outleasings.
- Picnic area.

RESERVOIR PLAN

SCALE IN FEET  
0 1000 2000



AREA AND CAPACITY CURVES

DRAINAGE AREA 128 SQ. MI.

NO.	CHARACTER	DATE	BY
1	Contours Revised	12054	S.F.C.
REVISIONS			

MERRIMACK RIVER FLOOD CONTROL			
BLACKWATER DAM			
RESERVOIR MAP			
BLACKWATER RIVER	SHEET NO. 1	NEW HAMPSHIRE	
IN 1 SHEET		SCALE 1 IN. = 1000 FT.	
NEW ENGLAND DIVISION, BOSTON, MASS.		FEB. 1947	
APPROVAL RECOMMENDED <i>John E. Allen</i> CHIEF ENGINEERING DIVISION		APPROVED <i>W. H. ...</i> SFC COLONEL CORPS OF ENGINEERS ASST TO DIVISION ENGINEER	
SUBMITTED <i>H. J. ...</i> CHIEF CIVIL WORKS BRANCH			
PROJECT NO.	FILE NO.	M 13-3/12	



